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A

PRACTICAL ESSAY

ON

MILKING.

BY

WILLIAM BLURTON,

OF FIELD HALL, UTTOXETER.

INVENTOR OF THE PORTABLE FLOODGATE SCREW LEVER, THE SWING CHEESE FRAME, MILKING SYPHON, SYPHON CAN, CURD SLICE TO BREAK DOWN THE CHEESE IN THE KETTLE, AND IMPROVER OF THE IRON LEVER CHEESE PRESS.

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A

PRACTICAL ESSAY

&c.

Dairy Farming is obviously so important a department of Rural Economy, that I trust no apology will be required, for attempting to draw the attention of those interested in the pursuit, to an Essay, the object of which is, to introduce some improvements in the method of Milking Cows, by which this process will be more efficiently performed than heretofore. I shall, therefore, instead of any other preface to the following pages, briefly state the circumstances which led me to a series of experiments on that subject, the result of which I shall then beg leave to offer.

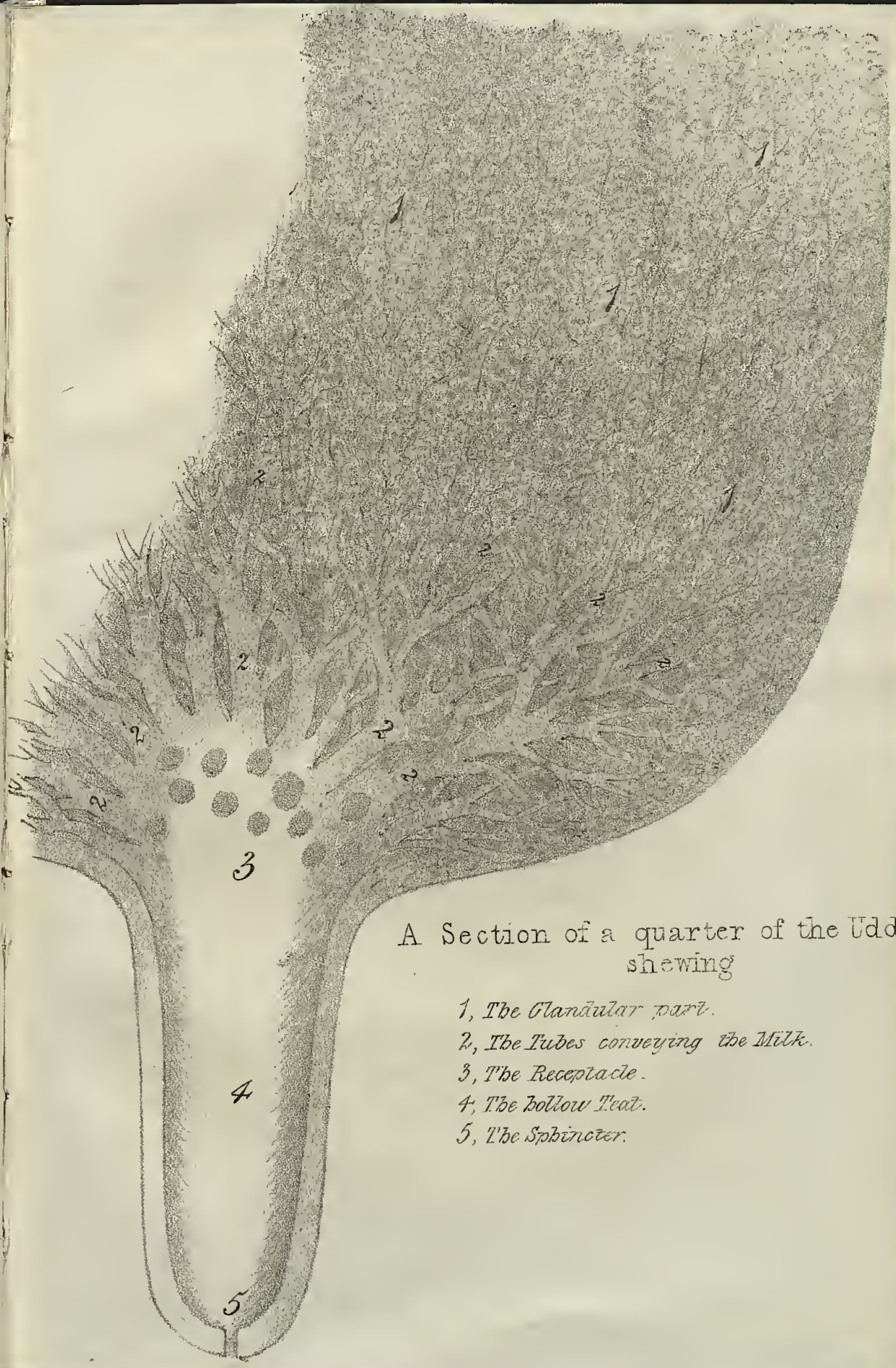
I derived my earliest experience of Farming from a near relative, who kept a Dairy of from 30 to 32 Cows, besides other Stock; and conceiving that the milk from each Cow might not have been sufficiently discharged at every "*meal*," or *milking*, (although as well milked as cows in large dairies generally are,) I determined on *dripping* them, or, as we use the term in Staffordshire, "*aftering*" them wholly myself. Ac-

cordingly, I commenced doing so early in the month of May, and continued till the latter end of November of the same year.

The Cheese was sold at the usual time; and on reference to the annual sales, I found that on taking the average of the fifteen preceding years, the increased quantity of Cheese made, in the last year, was 23½ cwt. of the Staffordshire cwt. of 120lbs.; but, as no statement remains of the quantity of Butter, and other consequent accruing profits, made either in that, or in the fifteen previous years, my readers must form their own opinion of the increase of those also, in estimating the additional profits of the Dairy in the last year.

I consider the above mentioned fact of sufficient importance to justify me in obtruding myself on the notice of Dairy Farmers generally, to whom I am anxious to render a service, by publishing the following remarks, derived entirely from my own observations and practical experience.

Preliminary to those practical remarks, I beg leave to introduce a Lithographic Engraving, which represents a section of a quarter of a Cow's udder, made after a minute dissection of the part. For the drawing of which with the observations as to the secretion of milk &c. I am indebted to the kindness of a Medical Friend. My scientific readers and the well informed Dairy Farmer will, I am sure, peruse it with pleasure and improvement.



A Section of a quarter of the Udd
shewing

1, The Glandular part.
2, The Tubes conveying the Milk.
3, The Receptacle.
4, The hollow Teat.
5, The Sphincter.

"With the position and outward appearance of the udder of the cow, every one is sufficiently acquainted; but the structure of the internal parts is so little known, and their functions so imperfectly understood, that a few plain observations, tending to diffuse and establish more correct ideas concerning them, cannot but be acceptable to all persons interested in dairying. In anatomical language, the udder is named a "secreting gland," that is, a substauce in which a specific fluid is secreted or separated from the blood; there are several of these kinds of glands, performing very important functions in the animal economy, such as the salivary glands in the mouth, the liver which secretes the bile, &c. All these glands are provided with tubes, to convey the secreted fluid to its destination. The udder of the cow is in general divided into four distinct parts or quarters, having no direct communication with each other, being in fact four separate glands, connected with each other by what is termed "*cellular membrane*" These four parts are so uniformly alike in their construction that the description of one will serve for all. It may be divided into three parts, the glandular or secreting part; (See No. 1 in the engraving;) the tubes which carry away the secreted fluid; (See No. 1. and 2.) and the teat. (See No. 4.) The Glandular or secreting part forms by far the largest portion of the udder: when cut into, it appears to the eye composed of a mass of yellowish grains; but, under the microscope, these granular substances are found to be entirely constituted of minute blood vessels, closely compacted and interwoven with each other. It is in these extreme ramifications that the process of secretion is accomplished; the milk is there distilled, as it were, from the blood. As soon as the milk is formed, it is carried off by a number of small tubes, (See No. 1. and 2.) which unite and form larger and larger branches, until they terminate in several large trunks which empty themselves into a kind of bag, or reservoir at the upper part or root of the teat; (See No. 3.) these are the lactiferous or milk-carrying tubes. (See No. 2.) The teat is hollow, and forms the lower part of the reservoir. (See No. 4.) About

a quarter of an inch from the end of the teat the internal lining is contracted or drawn together, so as to close up the lower part, leaving a small opening not exceeding an eighth of an inch in diameter. This orifice is kept closely shut by the natural elasticity of the part acting as a sphincter,* and thus effectually preventing the escape of the milk. In milking it requires considerable power of the hand to force the milk through this contracted passage; and in sucking, the production of a vacuum is necessary before the milk will flow into the mouth of the calf.

Thus, then, we perceive that the milk is abstracted from the blood in the glandular part of the udder; the tubes receive and deposit it in the reservoir or receptacle; and the sphincter at the end of the teat retains it there, till it is wanted for use. But we must not be understood to mean, that all the milk drawn from the udder at a *milking* or "*meal*," as it is termed, is contained in the receptacle. The milk, as it is secreted, is conveyed to the receptacle, and when this is full, the larger tubes begin to be filled, and next the smaller ones, until the whole become gorged. When this takes place, the secretion of the milk ceases, and absorption of the thinner or more watery parts commences. Now as this absorption takes place more readily in the smaller or more distant tubes, we invariably find, that the milk from these, which comes the last into the receptacle is much thicker and richer than what was first drawn off. This milk has been significantly styled "*afterings*" & should this gorged state of the tubes be permitted to continue beyond a certain time, serious mischief will sometimes occur; the milk becomes too thick to flow through the tubes & soon produces, first irritation, then inflammation, & lastly suppuration, and the function of the gland is materially impaired or altogether destroyed; hence, the great importance of emptying these smaller tubes regularly and thoroughly, not merely to prevent the occurrence of disease, but actually to increase the quantity of milk; for so long as the smaller tubes are kept free, milk is con-

* "Sphincter" from a Greek word, signifying to shut up.

stantly forming, but whenever, as we have already mentioned, they become gorged, the secretion of milk ceases until they are emptied. The Cow herself has no power over the sphincter at the end of the teat, so as to open it, and relieve the overcharged udder; neither has she any power of retaining the milk collected in the reservoir, when the spasm of the sphincter is overcome; for a small tube introduced through the orifice into the receptacle will drain off all the milk in it, and the larger tubes immediately connected with it. But it is very evident that she possesses some unexplainable power of retaining the milk in the smaller tubes so as to prevent it flowing into the receptacle; this is well known to every one accustomed to milking, under the term "*holding the milk*;" but in what part this power resides, or how it acts, is at present a mystery."

The mysterious cause of the Cow "holding," or retaining her Milk in the upper portion of the udder, has never, that I know of, been satisfactorily accounted for. My own opinion is, that it is generally caused by nervous irritability, as I have known the common functions of nature, both of the cow and other animals, arrested by angry or excited feelings; and having that impression, I particularly require the Cowman, as well as the other persons employed by me in milking, to adopt kind and gentle usage, and on no account to beat, or use violence towards any of the cows during the time of milking; knowing, from experience, that the habit of holding the milk, from whatever cause it may arise, when once acquired, is seldom entirely abandoned.

I have not yet been able to discover whether the Cow has the power of "holding," or retaining,

her milk by her own free will; but of this I am certain, that she does not possess the power of holding it, in one quarter of the udder, and, of allowing it at the same time to flow freely from the others. This I have proved by the practical use of the "milking syphon," of which I shall speak hereafter.

It is well understood that the Cream, or richer quality of the Milk, disengages itself from the thinner portion, when left to stand in the milk pan. This is caused by the specific gravity of Cream being less than that of Milk, and, on this principle, may not that which is contained in the upper part of the Udder have ascended as the secretion has been carried on, and have formed what is called "*afterings*" or *drippings*? I beg to submit this opinion with the greatest deference for the explanation given by my scientific friend, which is already before my readers.

The "*afterings*" being more of the nature of cream, and consequently less fluid than the first portion of the milk, have a greater tendency to adhere to the lactiferous tubes. (See No. 1 & 2, in the engraving.) It therefore requires more than the ordinary attention, generally given by milkers, to abstract it wholly from the upper portion of the udder; consequently dripping or "aftering," in the manner I shall presently describe, must be had recourse to.

Perhaps in some small Dairies, where the Farmer and his wife milk the whole of the Cows, "*aftering*" them may not in all cases be necessary; but

in a large Dairy where several persons are employed in milking, it becomes quite essential, that some one interested, or some trust-worthy person, should take care that the whole of the milk in every instance be discharged from the udder; otherwise a very serious loss might eventually be sustained.

Whoever has observed the calf in the action of sucking, must have noticed its natural propensity, immediately after its birth, to push its nose frequently and with considerable violence against the udder of the cow; so much so that I have often been apprehensive lest its violence should increase the tendency to inflammation, which the milking cow is liable to when fed with too much succulent food. This propensity in the calf I conceive to be instinctive, and given by the Author of Nature to cause the cow to give down her milk freely to her offspring, and this disposition is not peculiar to the calf, but is observable in the lamb and many other young animals. Hence, it follows, that milking *hard* or *fast*, or what is sometimes called milking with a *powerful stroke*, so as to agitate or shake the udder a good deal, but not to scatter the milk, is greatly preferable to the slow method; and the idle milker, I would have discarded as wholly unfit for the performance of a duty, so important to that Farmer, whose rent is principally drawn from the produce of his Dairy.

The common method of milking is well understood; I need therefore only observe, in reference

to it, that the milker should be instructed to milk as fast as his strength will allow him, and when he has obtained all the milk he can, by the common method, he should be required to press moderately with his left hand, the upper and every part of the udder; so as to force downwards all the milk that may remain in the smaller milk-carrying tubes (marked 1 and 2 in the engraving;) and as it is pressed into the receptacle and teat, (marked 3 and 4,) he should milk it out with his right hand, until the whole be completely discharged. The same plan must be pursued with the remaining quarters of the udder. It must not be supposed that this method is distressing to the animal: on the contrary, her quietness during the process is a satisfactory indication, that it occasions no pain, but rather an agreeable sensation.

This plan, though so essential in keeping the cow up to her full quantum of milk, will not, generally speaking, take more additional time than a minute, to complete, than the old customary careless method of milking; and that is amply compensated for by the time saved to the *dripper*. I may further add that the milker should be very strictly required to persevere in this plan, and in time he will feel ashamed of leaving, even the smallest portion of milk in the udder, for the dripper to complain of. In aftering, I have adopted the plan, of using the left hand to press down the thick milk, into the receptacle and teat at the same time, milking it out with the right hand;

then in a similar manner, discharging the whole from the remaining quarters of the udder.

I hope what I have said will convince the young Dairy Farmer, of the great importance of personally superintending the milkers, and of the very great loss he may sustain by bad or negligent milking. When performed in a scientific manner, the occupation of milking will cease to be considered irksome and laborious; to me it has the aspect of an ingenious, and agreeable amusement.—In connection with this view of the subject let me urge the advantage and pleasure of early rising:

> "Roused by the Cock, the soon clad Cowman leaves
> His mossy cottage where with peace he dwells;—
> And springing from the bed of sloth enjoys
> The cool, the fragrant, and the silent hour:—
> Who would in such a gloomy state remain
> Longer than nature craves?"

I am anxious here to correct an error which I committed in the original prospectus, containing my description of the method of using the "Milking Syphon," into which error, I fear, I may have led some portion of my friends. I was then of opinion that the introduction of the tube of the Syphon into the orifice of the sphincter muscle would be sufficient to draw all the milk from the udder; but I have found from subsequent experiments, that the action of the hand, as in the common method of milking, is essen-

tial to a perfect discharge of the milk, and I am, therefore obliged, though reluctantly, to adopt the following method in using the milking syphon.

The milker sits down as in the common method, fixing the Syphon Can firmly between his knees: he then takes hold of the near hand teat, with a slight pressure of his right hand, and with his left introduces the small tube of the syphon an inch or more into the teat, putting the thumb on the large tube, to prevent the milk from running out till completely introduced, and so on with the near fore teat, reserving the two farthest teats to be milked by hand. By this method, I find, that I can milk three teats with my right hand, assisted by the Syphons, in the time I can milk one with my left, and this with ease and comfort to myself. I must here also observe that the action of milking one or two teats by hand, is quite sufficient to induce the cow to give her milk down freely from those milked by the Syphon; and, as I have before observed, the cow does not possess the power of retaining her milk in any one quarter of the udder, while it flows freely from the others.

The greatest quantity of milk is generally contained in the hind quarters of the udder, and although it is usual in this neighbourhood to sit on the right side to milk, I have latterly preferred the left, especially as I use the Syphons to the two nearmost teats, and my right hand possessing more muscular power than my left, each hand is better adapted to its portion

of labour, and the custom of milking on the right side, is easily overcome.

When a cow calves at a season when the pastu rage is luxuriant, the udder sometimes becomes greatly overcharged and in consequence considerably inflamed. In such a case, it is of the greatest importance to use every means to reduce the inflammation in its early stages, lest its continuance should induce a thickening of the glandular portion of the udder. When this is produced, a hard substance, or substances may be felt, the reduction of which may be a matter of great difficulty. Under these circumstances, it is advisable that the Animal should be kept in the shed, for a day or two, and restricted to a moderate portion of food. She should be milked 3 or 4 times a day; and, at each time, a continued but moderate friction of the hand should be used. Without these precautions a difficulty of abstracting the milk, and a consequent reduction of the quantity obtained, is certain to ensue.

I have, this season, introduced several Heifers into my dairy, and have paid great attention to the Dripping of them. The consequence has been a considerable increase of the quantity of milk, no enlargement of the gland has taken place and I conceive, if I pursue the same course, they will hold out as long as the nutritive quality of the pasturage continues.

To this I must except one Heifer, that has got the habit of "holding" a portion of her milk, which

if not overcome, will produce the certain consequence of an enlargement of the Glandular portion of the udder, with gradual trucking of her milk, and thus cause her to be let off, and sold at the latter end of the year.

The Syphon Can (see engraving) should be about 9½ in. deep, 10½ in. in diameter at the top, and 10. in. at the bottom. The Flange is thrown out, 1½. in. from the perpendicular of the side of the can, and soldered to the top of the front of the can extending to the loop holes, and is also soldered to them, (see engraving.) This flange not only prevents the shedding of milk, but greatly lessens the danger of the cow getting her foot into the can. I would not advise the milker to use the Syphon without it.

The Syphons, before being used, should be thrown into the can and milked upon, and when taken out of the teat, let fall into the can. When they have been in use, they should be dipped in boiling water, and blown through.

I now for the present take leave of my readers and the subject of dairy farming; and at the conclusion of this my first attempt "to write a Book," I am sure, it will not be considered necessary for me to apologize, for any defects or errors in composition. It is not as a writer, that I come before them, but as a practical dairy farmer one of a body of men from whom I have all my life received many kindnesses, and with whom I am connected by many ties. My

The Syphon Can.

aim has been to introduce some improvement in the business of dairy farming, and to make some suggestions tending to increase the productiveness of that most useful animal the Cow,

> "Full uddered, lowing round
> The Cheerful Cottage, and affording food,
> The food of innocence and health."

I shall be gratified If I have been the means of exciting attention to the subject; and whilst bringing forward any real improvement connected with it, if I have, in doing so, promoted in any degree the views and objects of that portion of the community, and that important interest—the Landed Interest—by which I am surrounded, and to which I am and ever have been strongly attached, I shall consider the objects I proposed to myself as fully accomplished.

Since the above remarks were sent to press, I have endeavoured to overcome the heretofore incorrigible habit of a Cow holding her milk, and in making some experiments on the subject I found the following one quite successful, in four different instances. The process consists in greatly increasing the usual action in aftering; or in pressing the udder more strongly upwards, and the teat downwards. It is true that I did not obtain much milk at first, but by continuing it a short time, the cows experimented on gave it freely from every quarter of the udder.

The last experiment applies to aftering only.

I have since most satisfactorily proved, that when a cow shews the well known disposition to hold her milk, the milker, by increasing the action as before stated, will put it out of her power to do so.

Field Hall, June 10th, 1839.

The following articles are sold by me, at the undermentioned prices, for ready money only.

	£.	s.	d.
The portable iron screw lever, for floodgates, with thimbles and iron pins complete.	1	8	0
Model of the swing cheese frame.	1	1	0
Patent milking syphons ℔ set of four.		10	0
Syphon can.		5	0
Steel cutting slice for separating the curds from the whey with the least loss.		14	0
Portable iron lever cheese press.	3	3	0

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